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**(54) Title:** METHOD AND COMPOSITION FOR TREATING ACNE**(57) Abstract**

A method of treating skin conditions utilizing a deodorizer composition containing sulfurated lime solution, and the composition therefor.

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METHOD AND COMPOSITION FOR TREATING ACNE

This is a continuation-in-part of Serial No. 139,401 filed April 11, 1980, which is a continuation of Serial No. 967,485 filed December 7, 1978, now abandoned.

Field of the Invention

5           This invention relates to methods of topically treating acne and oily skin and compositions useful for said treatment. The invention also relates to a method for deodorizing compositions containing sulfurated lime solution which are intended for topical administration, and for preventing stain  
10 of skin or fabric as well as discoloration of jewelry by the composition.

Background of the Invention

It is well established that acne is associated with sebum production and that androgens stimulate sebum production  
15 whereas estrogens suppress sebum production; estrogen therapy being indicated as a possible means of treating acne. Several reports indicate that oral contraceptives or the individual active estrogenic components thereof, for example, ethinyl estradiol and derivatives are useful in treating acne in both  
20 males and females. In recent years it has become apparent that estrogenic products currently in use possess certain undesirable side effects which must be set against the undoubted benefits resulting from their use. The use of estrogens for the treatment of acne in women can lead to uterine bleeding  
25 and spotting and breast tenderness. In men, estrogen administration can have a feminizing effect and may result in

gynecomastia and impotence [L.F. Goodman and A. Gilman, The Pharmacological Basis of Therapeutics, 4th Ed., The MacMillan Company, p. 1537 (1970)]. Estrogenic therapy has been reported to give rise to other deleterious side effects. For example, diethylstilbestrol, a once widely used and well established estrogen has been implicated as possibly being responsible for vaginal cancer and adenosis in the female offspring of pregnant women treated with the compound (Lancet 1975, 1960). Also ethinyl estradiol and mestranol, which represent estrogenic compounds in current oral contraceptives including depression [Nature 243, 58 (1973)], hypertension [Am. J. Obstet. Gynecol. 112, 912, (1972)], carbohydrate and lipid abnormalities (Lancet 1969, p. 783), interference with blood clotting mechanism resulting in thrombosis and stroke [Ann. Intern. Med. 72, 111, (1970)], and jaundice [Am. J. Obstet. Gynecol. 119, 1965, (1974)]. Consequently, there is a need for an improved method of treating acne.

The present invention provides a novel method and composition of topically treating acne and oily skin with a nonsteroidal agent.

A sulfurated lime solution has been found to be effective in the treatment of various skin conditions. However, sulfurated lime solution, an amber, staining liquid yields an objectionable odor which precludes its use on the face or chest. The present invention now provides a means for deodorizing the compositions which utilize sulfurated lime solution so as to be generally acceptable for cosmetic and therapeutic use.

#### Summary of the Invention

The present invention relates to a method of treating acne and oily skin by the administration of a sulfurated lime solution in a vehicle containing a mixture of clays, and, if desired, pigment extenders.

This invention also relates to pharmaceutical preparations suitable for topically treating acne and oily skin. This invention also relates to anti-acne and anti-seborrheic pharmaceutical preparations.

Additionally, this invention relates to a means for removing any objectionable odor from cosmetic and therapeutic compositions which contain sulfurated lime solution while simultaneously releasing any added perfume fragrances and still retaining its efficacy.

This invention further relates to a method for topically administering a solution of sulfurated lime which is free from objectionable odors.

Still further, the composition of this invention provides the use of sulfurated lime solution without the problem of staining clothing or tarnishing jewelry.

#### Detailed Description of the Invention

As used herein the term "acne" is intended to mean any inflammatory disease or condition of the sebaceous gland commonly occurring at puberty resulting in comedones, pustules, papules, inflamed nodules or infected cysts. A solution of sulfurated lime in combination with a finely divided sorbent powder consisting of a mixture of clays, namely, a montmorillonite clay in combination with attapulgite, has been found to be effective in reducing the amount of sebum produced by sebaceous glands.

The composition of the present invention, when administered to a patient having an acne condition or oily skin condition, represents a novel method of treating acne which offers distinct advantages over previously employed methods of treatment, for example, estrogen therapy, in that the compounds employed do not result in certain deleterious side effects resulting with estrogen therapy as will become more apparent hereinafter.

"Sulfurated lime" as used herein is commercially available and may be prepared according to the procedure disclosed in Mellor, Vol. III, p. 740 (1928). Generally, sulfurated lime contains not less than 55% calcium sulfides and carbonate, and the "ash" from the carbonaceous material from which it is formed.

It has been surprisingly discovered that the combination of a montmorillonite clay and attapulgite removes

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the odor of the sulfurated solution while releasing any perfume odor which may be present.

The clay which may be utilized in the composition of the present invention are the natural and synthetic  
5 montmorillonite clays such as the bentonites, kaolin, hectorite, smectites and saponites or mixtures thereof in combination with attapulgite.

Montmorillonite is the name of a group of clays with an expanding lattice which are members of the clay-  
10 mineral group. The montmorillonites contain aluminum silicates with some montmorillonites having some of the aluminum replaced by magnesium.

The sulfurated lime composition of the present invention can be administered in various manners to achieve  
15 the desired effect. The amount of sulfurated lime solution in the composition will vary with the severity of the acne or oily skin condition and the mode of administration. Generally, the sulfurated lime solution comprises about 1-20% by weight of the total composition, preferably 2-10%  
20 weight of the total composition. The sorbent powders are employed in the amount of about 5-50% by weight of composition. The sorbent powder to be an effective deodorant for the sulfurated lime solution must contain at least about 2-9% by weight of a montmorillonite clay based on the weight  
25 of attapulgite based on the weight of the total composition. The topical formulation of the present invention may contain pharmaceutically acceptable surfactants, particularly those having a detergent action for microabrasion of the uppermost layer of the skin, i.e., horny layer, to provide a smooth  
30 feeling to the skin, soothing agents such as camphor, cooling agents such as menthol, dispersing agents, penetrants, perfumes, and a conservation agent such as butylated hydroxytoluene.

The addition of calcium carbonate to the composition  
35 has been found to be advantageous for maintaining the composition's alkalinity and color. Also, it is useful in providing a micro abrasive effect so as to remove the horny layer of the skin and leave a smooth feeling.

BUREAU



Talc may be added to the composition to improve the slip qualities of the composition on the skin.

An effective amount of the other acne-treating agents may be incorporated in the composition such as in an amount of up to 6% by weight of the composition. These additional active ingredients include salicylic acid, resorcinol and its derivatives, retinoic acid and its derivatives, sulfur, erythromycin, and the like. Aerosol preparations containing the sulfurated lime solution and the mixture of clays together with extenders in the form of a finely grouped powder may also be employed for topical administration. The aerosols may be packaged in a pressurized aerosol container together with a gaseous or liquified propellant, for example, dichlorodifluoromethane, dichlorodifluoroethane, carbon dioxide, nitrogen, or propane with the usual adjuvant such as a suspending agent and wetting agents as may be necessary or desirable. Although the present formulation may be applied directly to the site requiring treatment, it is preferably applied in the form of a face mask so that during its application, the absorbing and adsorbing action of the sorbent powder on the face oils takes place and the sulfurated lime becomes more effective in the desired treatment of the skin condition.

The following Examples are illustrative of formulations of compositions according to this invention.

#### EXAMPLE 1

A composition for use as a face mask containing the following composition:

|    |  |        |
|----|--|--------|
| 30 | Sulfurated lime solution<br>(Vleminckx's solution)   | 5 ml   |
|    | Colloidal aluminum magnesium<br>silicate (Veegum <sup>®</sup> ) (a mont-<br>morillonite type clay) | 750 mg |
|    | Attapulgit   | 250 mg |
| 35 | Sodium lauryl sulfate  | 150 mg |
|    | Butylated hydroxytoluene   | 15 mg  |
|    | Purified water   | q.s.   |

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was prepared as follows:

Into a beaker containing 5 ml of sulfurated lime solution, 150 mg of sodium lauryl sulfate, 15 mg of butylated hydroxytoluene and 10 ml of purified water was stirred in 5 750 mg of colloidal aluminum magnesium silicate and 250 mg of attapulgite until a uniform paste was formed. The composition contained essentially no sulfur odor and was suitable for forming a face mask in the treatment of acne.

#### EXAMPLE II

10 A composition for the treatment of acne and seborrheic conditions having the following:

|    |                                  |        |
|----|----------------------------------|--------|
|    | Sulfurated lime solution         | 20 ml  |
|    | Hectorite clay                   | 1.5 g  |
|    | Attapulgite                      | 0.75 g |
| 15 | Polyethylene glycol monostearate | 0.50 g |
|    | Purified water                   | q.s.   |

was prepared as follows:

Into a beaker containing 20 ml of sulfurated lime solution was added 1.5 g of Laponite®, a commercially available hectorite clay and 0.75 g of attapulgite. Purified 20 water was then heated and mixed with polyethylene glycol monostearate until uniform. Then mixed and cooled to room temperature. This was then added until a thick paste was formed that was spreadable by use of an applicator stick.

25

#### EXAMPLE III

A paste for a face mask for use in the treatment of severe acne and having an anti-seborrheic effect comprising:

|    |                          |       |
|----|--------------------------|-------|
|    | Sulfurated lime solution | 20 ml |
|    | Retinoic acid            | 12 mg |
| 30 | Sodium lauryl sulfate    | 0.5 g |
|    | Bentonite                | 2 g   |
|    | Attapulgite              | 1 g   |
|    | Purified water           | q.s.  |

was prepared as follows:

35 Into a beaker containing 20 mg of sulfate lime solution was added with stirring 0.5 g of sodium lauryl sulfate,

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12 mg of retinoic acid, 1 g of attapulgit and 2 g of pulverized bentonite clay. Purified water was then added to the mixture until a paste of a desired consistency was obtained. The resulting paste may then be applied directly to the site requiring treatment. A current of warm air may then be blown on the face until the mixture dries. The composition is maintained on the face for about 20 to about 30 minutes and then removed by washing with water. The treatment is administered either every other day or daily until the condition treated is alleviated.

#### EXAMPLE IV

|    | <u>Ingredients</u>   | <u>%</u> |
|----|--|----------|
|    | Vleminckx's solution   | 6.00     |
| 15 | Partially acetylated polyoxyethylene lanolin ether (Laneth-10 acetate) | 2.00     |
|    | Decyl oleate   | 0.60     |
|    | Alcohol  | 7.00     |
|    | Titanium dioxide   | 3.00     |
|    | Kaolin   | 15.00    |
| 20 | Calcium carbonate  | 2.30     |
|    | Attapulgit   | 3.50     |
|    | Calcium silicate   | 2.00     |
|    | Silica   | 0.225    |
|    | EDTA   | 0.10     |
| 25 | Paraben  | 0.20     |
|    | Dioctyl sodium sulfosuccinate  | 0.16     |
|    | Fragrance  | 0.10     |
|    | Fatty alkanolamide   | 5.00     |
| 30 | Sodium sulfate of an ethoxylated fatty alcohol                         | 5.00     |
|    | Purified water   | q.s.     |

The formulation was effective for the treatment of acne and oily skin conditions. Removal of the paste after drying by water washing gave a smooth feeling to the skin.

35

#### COMPARISON EXPERIMENT A

A suflur-containing lotion was prepared utilizing a conventional formulation with the following ingredients:

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|    | <u>Ingredients</u> | <u>%</u> |
|----|--------------------|----------|
|    | Sulfur (U.S.P.)    | 5.00     |
|    | Cellulose gum      | 0.45     |
|    | Propylene glycol   | 3.00     |
| 5  | Attapulgate        | 2.00     |
|    | Iron oxide         | 1.20     |
|    | Alcohol            | 20.00    |
|    | Fragrance          | 0.10     |
|    | Fatty alkanolamide | 2.00     |
| 10 | Methyl paraben     | 0.15     |
|    | Talc               | 7.00     |
|    | Zinc oxide         | 7.00     |
|    | Deionized water    | q.s.     |
|    | Titanium dioxide   | 4.00     |

# 15 COMPARISON EXPERIMENT B

A lotion was prepared utilizing the formula of Experiment A except that a sulfurated lime solution (Vleminckx's solution) was utilized in lieu of sulfur.

TABLE I

|    | <u>Sample</u>             | <u>Odor</u>            | <u>Cosmetic Effect</u>      |
|----|---------------------------|------------------------|-----------------------------|
| 20 | 1. Vleminckx's solution   | Objectionable          | Poor (not suitable for use) |
|    | 2. Elemental sulfur       | Slightly pungent       | Poor (could be used)        |
|    | 3. Paste of Experiment 4  | Pleasant               | Good                        |
|    | 4. Lotion of Experiment A | Pleasant               | Good                        |
| 25 | 5. Lotion of Experiment B | Slightly Objectionable | Fair (not suitable for use) |

It was noted that elemental sulfur by itself or in a conventional carrier could be utilized by patients without any objectionable odor being present. Use of a sulfurated lime solution by itself or in a conventional carrier such as those containing elemental sulfur still produced an objectionable odor which would prevent use on the face area. A formulation prepared according to Example 4 had a pleasant odor

and could be utilized for skin care.

EXPERIMENT C

A. Mixtures of 6% sulfurated lime solution and the following clays were prepared with sufficient water to give paste-like consistencies:

TABLE I

|    | <u>Clay</u>         | <u>Test A</u><br>(parts<br>by wt) | <u>Odor</u> | <u>Test B</u><br>(parts<br>by wt) | <u>Odor</u> |
|----|---------------------|-----------------------------------|-------------|-----------------------------------|-------------|
| 10 | 1. Bentonite        | 10                                | Pungent     | 20                                | Pungent     |
|    | 2. Kaolin           | 10                                | Pungent     | 20                                | Pungent     |
|    | 3. Attapulgate      | 10                                | Pungent     | 20                                | Pungent     |
|    | 4. Calcium silicate | 10                                | Pungent     | 20                                | Pungent     |

The pungent "rotten egg" odor of the sulfurated lime solution was evident although somewhat diminished in each of the formulations. Each mixture caused a light yellow stain when applied to fabric. Contact with silver jewelry resulted in tarnishing.

B. Mixtures were prepared according to the procedure of Part A.

TABLE II

|    | <u>Clay</u>      | <u>Test A</u><br>(parts by<br>wt) | <u>Odor</u> | <u>Test B</u><br>(parts by<br>wt) | <u>Odor</u> |
|----|------------------|-----------------------------------|-------------|-----------------------------------|-------------|
| 25 | 1. Bentonite     | 10                                | Slight      | 20                                | Slight      |
|    | Kaolin           | 10                                | Pungent     | 10                                | Pungent     |
|    | 2. Bentonite     | 10                                | None        | 20                                | None        |
|    | Attapulgate      | 10                                |             | 10                                |             |
| 30 | 3. Bentonite     | 10                                | Slight      | 20                                | Slight      |
|    | Calcium silicate | 10                                | Pungent     | 10                                | Pungent     |
|    | 4. Kaolin        | 10                                | None        | 20                                | None        |
|    | Attapulgate      | 10                                |             | 10                                |             |
|    | 5. Kaolin        | 10                                | Slight      | 20                                | Slight      |
|    | Calcium silicate | 10                                | Pungent     | 10                                | Pungent     |

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TABLE II (continued)

|   | <u>Clay</u>         | <u>Test A</u><br>(parts<br>by wt) | <u>Odor</u> | <u>Test B</u><br>(parts<br>by wt) | <u>Odor</u> |
|---|---------------------|-----------------------------------|-------------|-----------------------------------|-------------|
| 5 | 6. Calcium silicate | 10                                | Slight      | 20                                | Slight      |
|   | Attapulgate         | 10                                | Pungent     | 10                                | Pungent     |

TABLE III

|    | <u>Clay</u>  | <u>Parts by wt.</u> | <u>Odor</u> |
|----|--------------|---------------------|-------------|
|    | 1. Bentonite | 9.0                 | Slight      |
|    | Attapulgate  | 0.5                 | Pungent     |
| 10 | 2. Bentonite | 9.0                 | None        |
|    | Attapulgate  | 1.5                 |             |
|    | 3. Kaolin    | 9.0                 | Slight      |
|    | Attapulgate  | 0.5                 | Pungent     |
| 15 | 4. Kaolin    | 9.0                 | None        |
|    | Attapulgate  | 1.5                 |             |

The use of 1.5 parts of attapulgate yielded a mixture which was virtually free of sulfurated lime solution odor. Mixtures (2) and (4) caused no staining of fabrics. Contact with silver, gold and chrome plated jewelry caused no tarnishing, even after 10 hours of contact.

BUREAU

What is claimed is:

1. A method for treating acne and oily skin in a patient in need thereof which comprises topically administering to said patient a composition comprising about 1-20% by weight of total composition of a sulfurated lime solution in a carrier comprising about 5-50% by weight of a sorbent powder, said powder comprising at least about 2-9% by weight of at least one montmorillonite clay based on the weight of the total composition and at least 1.5% by weight of attapulgite based on the weight of the total composition, said sorbent powder being present in an amount so as to deodorize said composition, to absorb and adsorb the skin oils and to release an effective amount of said sulfurated lime solution to treat said patient.

2. The method according to Claim 1 including a pharmaceutically acceptable surfactant.

3. The method of Claim 1 wherein said montmorillonite clay is selected from the group consisting of bentonite, hectorite, smectite, kaolin and saponite.

4. The method of Claim 1 wherein said sorbent powder comprises bentonite, kaolin, talc and calcium carbonate.

5. The method of Claim 1 including an effective amount of a compound selected from the group consisting of retinoic acid, salicylic acid, salicylic acid or resorcinol.

6. A method of treating oily skin in a patient in need thereof which comprises topically administering to said patient a composition comprising 1-10% by weight of a sulfurated lime solution and 5-50% by weight of pharmaceutically acceptable finely divided powder containing at least one montmorillonite clay powder in an amount of about 2-9% by weight based on the weight of the total composition, and at least 1.5% by weight of attapulgite based on the weight of the total composition, whereby said clays are present in an amount sufficient to deodorize said composition, to absorb and adsorb skin oils and to release an effective amount of sulfurated lime solution to treat said patient.

7. An anti-acne and anti-seborrheic pharmaceutical composition for topical administration comprising about 1-20% by weight of a sulfurated lime solution and 5-50% by weight of a carrier comprising a pharmaceutically acceptable finely divided sorbent powder which contains  
5 at least one montmorillonite clay in an amount of about 2 to about 9% by weight based on the weight of the total composition, and at least about 1.5% by weight of attapulgite based on the weight of the total composition, said sorbent powder being present in an amount which  
10 deodorizes said composition, absorbs skin oils, and releases an effective amount of said sulfurated lime solution to treat the patient.

8. The composition according to Claim 7 including a pharmaceutically acceptable surfactant.

9. The composition according to Claim 7 wherein said montmorillonite clay is selected from the group consisting of bentonite, hectorite, smectite, kaolin and saponite.

10. The composition according to Claim 7 wherein said sorbent powder comprises bentonite, kaolin, talc and calcium carbonate.

11. The composition according to Claim 7 including an effective amount of a compound selected from the group consisting of retinoic acid, salicylic acid or resorcinol.

12. A method for treating said acne and oily skin in a patient in need thereof which comprises topically administering to said patient a composition comprising an effective amount of a sulfurated lime solution in a carrier comprising a pharmaceutically finely divided inorganic  
5 sorbent powder.

13. The method of Claim 12 wherein the composition comprises about 1-10% by weight of sulfurated lime solution and about 5-50% by weight of said sorbent powder.

14. The method Claim 13 wherein said sorbent powder is a clay, pigment extender or mixtures thereof.

15. The method of Claim 12 wherein said sorbent powder is a clay selected from the group consisting of bentonite, hectorite, smectite, attapulgite, fuller's earth and montmorillonite clays.



16. The method of Claim 12, wherein said sorbent powder is colloidal aluminum magnesium silicate, kaolin, talc and calcium carbonate.

17. The method of Claim 12 including a compound selected from the group consisting of retinoic acid, salicylic acid, resorcinol and derivatives thereof.

18. A method of treating oily skin in a patient in need thereof which comprises topically administering to said patient a composition comprising 1-10% by weight of a sulfurated lime solution and 5-50% by weight of a pharmaceutically acceptable clay or pigment extender.

19. An anti-acne and anti-seborrheic pharmaceutical composition for topical administration comprising an effective amount of a sulfurated lime solution and 5-50% by weight of a carrier comprising a pharmaceutically acceptable clay, pigment extender or mixtures thereof.

20. The composition of Claim 19, wherein said sulfurated lime solution comprises 1-10% of said composition.

21. The composition of Claim 19 including a compound selected from the group consisting of salicylic acid, resorcinol, retinoic acid and derivatives thereof.

5. 22. A method for deodorizing cosmetic and therapeutic compositions having an objectionable odoriferous sulfur-containing compound which comprises incorporating in said composition an effective deodorizing amount of a pharmaceutically acceptable finely divided inorganic sorbent powder.

23. The method of Claim 22 wherein the composition comprises about 5-50% by weight of said sorbent powder.

24. The method of Claim 23 wherein said sorbent powder is a clay, pigment extender or mixtures thereof.

25. The method of Claim 22 wherein said sorbent powder is a clay selected from the group consisting of bentonite, hectorite, smectite, attapulgit, fuller's earth and montmorillonite clays.

26. The method of Claim 22 wherein said sorbent powder is colloidal aluminum magnesium silicate, kaolin, talc and calcium carbonate.

5 27. A method for deodorizing a composition comprising about 1-20% by weight of total composition of a sulfurated lime solution characterized by including in said composition about 5-50% by weight of a sorbent powder, said powder comprising at least about 2-9 parts by weight of at least one montmorillonite clay and at least 1.5 part by weight of attapulgite, said sorbent powder being present in an amount so as to deodorize said composition.

28. The method according to Claim 27 characterized by including a surfactant.

29. The method according to Claim 27 characterized by said montmorillonite clay consisting of bentonite, hectorite, smectite, kaolin or saponite.

30. The method according to Claim 27 characterized by said sorbent powder comprises bentonite, kaolin, talc or calcium carbonate.

5 31. The method according to Claim 27 characterized by said composition comprising 1-10% by weight of a sulfurated lime solution and adding 5-50% by weight of finely divided powder containing at least one montmorillonite clay in an amount weight of attapulgite, whereby said clays are present in an amount sufficient to deodorize said composition, to absorb and adsorb skin oils and to release an effective amount of sulfurated lime solution.

## AMENDED CLAIMS

(received by the International Bureau on 28 January 1982 (28.01.82))

- 1 to 31 (amended) 1. A method for treating acne and oily skin in a patient in need thereof which comprises topically administering to said patient an effective amount of a composition comprising about 1-20% by weight of total composition of a sulfurated lime solution in a carrier comprising about 5-50% by weight of a sorbent powder, said powder comprising at least about 2-9% by weight of at least one montmorillonite clay based on the weight of the total composition and at least 1.5% by weight of attapulgite based on the weight of the total composition, said sorbent powder being present in an amount so as to deodorize said composition, to absorb and adsorb the skin oils and to release an effective amount of said sulfurated lime solution to treat said patient.
2. The method according to Claim 1 including a pharmaceutically acceptable surfactant.
3. The method of Claim 1 wherein said montmorillonite clay is selected from the group consisting of bentonite, hectorite, smectite, kaolin and saponite.
4. The method of Claim 1 wherein said sorbent powder is selected from the group consisting of bentonite, kaolin, talc and calcium carbonate.
5. The method of Claim 1 including an effective amount of a compound selected from the group consisting of retinoic acid, salicylic acid or resorcinol.

6. A method of treating oily skin in a patient in need thereof which comprises topically administering to said patient an effective amount of composition comprising 1-10% by weight of a sulfurated lime solution and 5-50% by weight of pharmaceutically acceptable finely divided powder containing at least one montmorillonite clay powder in an amount of about 2-9% by weight based on the weight of the total composition, and at least 1.5% by weight of attapulgite based on the weight of the total composition, whereby said clays are present in an amount sufficient to deodorize said composition to absorb and adsorb skin oils and to release an effective amount of sulfurated lime solution to treat said patient.

7. An anti-acne and anti-seborrheic pharmaceutical composition for topical administration comprising about 1-20% by weight of a sulfurated lime solution and 5-50% by weight of a carrier comprising a pharmaceutically acceptable finely divided sorbent powder which contains at least one montmorillonite clay in an amount of about 2 to about 9% by weight based on the weight of the total composition, and at least about 1.5% by weight of attapulgite based on the weight of the total composition, said sorbent powder being present in an amount which deodorizes said composition, absorbs skin oils, and releases an effective amount of said sulfurated lime solution to treat the patient.

8. The composition according to Claim 7 including a pharmaceutically acceptable surfactant.

9. The composition according to Claim 7 wherein said montmorillonite clay is selected from the group consisting of bentonite, hectorite, smectite, kaolin and saponite.

10. The composition according to Claim 7 wherein said sorbent powder is selected from the group consisting of bentonite, kaolin, talc and calcium carbonate.

11. The composition according to Claim 7 including an effective amount of a compound selected from the group consisting of retinoic acid, salicylic acid or resorcinol.

12. A method for treating acne and oily skin in a patient in need thereof which comprises topically administering to said patient a composition comprising an effective amount of a sulfurated lime solutin in a carrier comprising a pharmaceutically acceptable finely divided inorganic sorbent powder, said sorbent powder being present in an amount which deodorizes said composition.

13. The method of Claim 12 wherein the composition comprises about 1-10% by weight of sulfurated lime solution and about 5-50% by weight of said sorbent powder.

14. The method of Claim 13 wherein said sorbent powder is a clay, pigment extender or mixtures thereof.

15. The method of Claim 12 wherein said sorbent powder is a clay selected from the group consisting of bentonite, hectorite, smectite, attapulgite, fuller's earth and montmorillonite clays.

16. The method of Claim 12, wherein said sorbent powder is selected from the group consisting of colloidal aluminum magnesium silicate, kaolin, talc and calcium carbonate.

17. The method of Claim 12 including a compound selected from the group consisting of retinoic acid, salicylic acid, resorcinol and derivatives thereof.

18. A method of treating oily skin in a patient in need thereof which comprises topically administering to said patient a composition comprising 1-10% by weight of a 6% sulfurated lime solution and 5-50% by weight of a pharmaceutical acceptable clay or pigment extender.

19. An anti-acne and anti-seborrheic pharmaceutical composition for topical administration comprising an effective amount of a sulfurated lime solution and 5-50% by weight of a carrier comprising a pharmaceutically acceptable clay, pigment extender or mixtures thereof.

20. The composition of Claim 19, wherein said sulfurated lime solution comprises 1-10% of said composition.

21. The composition of Claim 19 including a compound selected from the group consisting of salicylic acid, resorcinol, retinoic acid and derivatives thereof.

22. A method for deodorizing cosmetic and therapeutic compositions having an objectionable odoriferous sulfur-containing compound which is present in a sulfurated lime solution which comprises incorporating in said composition an effective deodorizing amount of a pharmaceutically acceptable finely divided inorganic sorbent powder.

23. The method of Claim 22 wherein the composition comprises about 5-50% by weight of said sorbent powder.

24. The method of Claim 23 wherein said sorbent powder is selected from the group consisting of clay, pigment extender or mixtures thereof.

25. The method of Claim 22 wherein said sorbent powder is a clay selected from the group consisting of bentonite, hectorite, smectite, attapulgite, fuller's earth and montmorillonite clays.

26. The method of Claim 22 wherein said sorbent powder is colloidal aluminum magnesium silicate, kaolin, talc and calcium carbonate.

27. A method for deodorizing a composition comprising about 1-20% by weight of total composition of a sulfurated lime solutin characterized by including in said composition about 5-50% by weight of a sorbent powder, said powder comprising at least about 2-9 parts by weight of at least one montmorillonite clay and at least 1.5 part by weight of attapulgite, said sorbent powder being present in an amount so as to deodorize said composition.

28. The method according to Claim 27 characterized by including a surfactant.

29. The method according to Claim 27 characterized by said montmorillonite clay consisting of bentonite, hectorite, smectite, kaolin or saponite.

30. The method according to Claim 27 characterized by said sorbent powder comprises at least one of bentonite, kaolin, talc or calcium carbonate.

31. The method according to Claim 27 characterized by said composition comprising 1-10% by weight of sulfurated lime solution and adding 5-50% by weight of finely divided powder containing at least one montmorillonite clay in an amount of about 2-9 parts by weight powder, and at least 1.5 parts by weight of attapulgite, whereby said clays are present in an amount sufficient to deodorize said composition, to absorb and adsorb skin oils and to release an effective amount of sulfurated lime solution.



# INTERNATIONAL SEARCH REPORT

International Application No PCT/US81/01063

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) <sup>1</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl. <sup>3</sup> A61K 33/04, A61K 33/08  
U.S. Cl. 424/160, 424/163

## II. FIELDS SEARCHED

Minimum Documentation Searched <sup>4</sup>

Classification System

Classification Symbols

U.S.

424/160, 424/163, 424/357

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched <sup>5</sup>

Chemical Abstracts, 1962-1980 under Heading Lime Sulfur,  
Sulfurated Limes, Clays

## III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>14</sup>

| Category <sup>6</sup> | Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>          | Relevant to Claim No. <sup>18</sup> |
|-----------------------|---|-------------------------------------|
| X                     | US, A, 1,800,502, Published 14 April 1931,<br>Brown   | 1-31                                |
| A                     | US, A, 2,156,790, Published 2 May 1939,<br>Missbach   | 1-31                                |
| X                     | N, Handbook of Non-Prescription Drugs, Fifth<br>Edition, Pub. American Pharmaceutical<br>Association, 1977, pp. 317-323 | 1-31                                |
| A                     | N, Encyclopedia of Chemical Technology,<br>Kirk-Othmer, Interscience Publishers,<br>1964, pp. 554, 580, 581             | 1-31                                |

<sup>6</sup> Special categories of cited documents: <sup>15</sup>

"A" document defining the general state of the art

"E" earlier document but published on or after the international  
filing date

"L" document cited for special reason other than those referred  
to in the other categories

"O" document referring to an oral disclosure, use, exhibition or  
other means

"P" document published prior to the international filing date but  
on or after the priority date claimed

"T" later document published on or after the international filing  
date or priority date and not in conflict with the application,  
but cited to understand the principle or theory underlying  
the invention

"X" document of particular relevance

## IV. CERTIFICATION

Date of the Actual Completion of the International Search <sup>2</sup>

13 October 1981

Date of Mailing of this International Search Report <sup>3</sup>

28 OCT 1981

International Searching Authority <sup>1</sup>

ISA/US

Signature of Authorized Officer <sup>20</sup>

*[Handwritten Signature]*

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